



NATIONAL WEATHER
SERVICE
DES MOINES IA

- Flood Safety and Severe Weather Awareness Weeks**



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Volume 3, Issue 1

Spring 2009

NWS Flood Safety Awareness Week: 16-20 March 2009

by Jeff Zogg, Senior Service Hydrologist



A Union Pacific bridge is partially swept away by high floodwaters on the Cedar River in downtown Waterloo, Iowa on Tuesday June 10, 2008. (AP Photo/The Waterloo Courier, Morgan Hawthorne)

Many people in Iowa personally witnessed or experienced the dangers of flooding during last year's historic floods. Flooding is the #2 storm-related killer in the United States, second only to lightning. Flooding kills more people each year than tornadoes and winter storms. On average, each year floods kill more than 100 people and are responsible for \$5.3 billion in damage. Flooding also takes many different forms, from river flooding to flash flooding to snowmelt flooding. It occurs in any month of the year and any time of day.

But, flooding typically doesn't happen very often. That's why it's important to know how to find important information, how to prepare

for potential flooding, where to obtain flood insurance if it is required in your area and to know general safety tips to help keep you, your family and your property as safe as possible.

This year will mark the fourth annual NWS Flood Safety Awareness Week. For each day during the week, a different flooding-related topic will be highlighted. We invite you to read about each of the below topics on the National Flood Safety Awareness Week web site at <http://www.floodsafety.noaa.gov/>.

Monday: Advanced Hydrologic Prediction System (AHPS). AHPS provides long-range river forecasts in addition to the five-day river forecasts you have always seen. These long-range forecasts give an indication of the risk of flooding over a three-month period. Although the AHPS forecasts are available on both our web site and in text format over the weather wire, our web site provides more detailed information.

(Continued on page 2)

NWS Severe Weather Awareness Week: 6-10 April 2009

by Jeff Johnson, Warning Coordination Meteorologist

The Iowa Homeland Security and Emergency Management and the National Weather Service have declared the week of April 6th through April 10th 2009 Severe Weather Awareness Week. Severe Weather Awareness Week is an annual event to remind Iowans that severe weather is part of being in Iowa and that understanding the risks and how to respond to them can save lives.

During Severe Weather Awareness Week, the National Weather Service will promote severe weather safety by issuing informative Public Information Statements. Daily topics will include flooding, severe thunderstorms, tornadoes, NOAA Weather All Hazards Radio, and family preparedness.

The highlight of the week will be the statewide tornado drill on Wednesday, April 8, 2009. This will begin around 1000 am and conclude by 1100 am for all 99 Iowa counties. All five Iowa National Weather Service offices which serve Iowa will participate in the drill.

(Continued on page 2)

2009 Spotter Training Begins – More Needed

by Brad Small, Senior Meteorologist

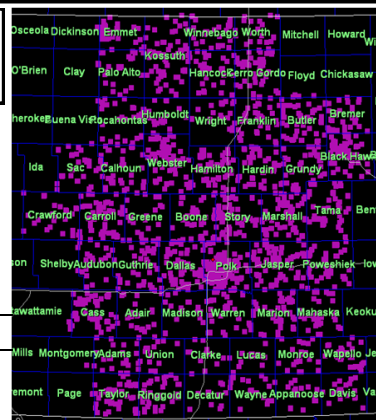
Spotter training is well underway with at least 40 talks scheduled throughout our 51 county warning area. Details on individual training sessions can be found by selecting the Spotter Training tab on our website (<http://weather.gov/desmoines>). The spotter talks are free of charge and open to the public on a first come, first served basis. Pre-registration is not required. If your county is not listed, contact your local emergency management officials and encourage them to host a training session. The National Weather Service does not host training sessions unless invited, often by emergency management coordinators, fire departments, or amateur radio groups.

Locations of NWS Spotters in Central Iowa

Spotters play a critical role in the warning process. Meteorologists typically consider three things when making warning decisions: 1) radar information, 2) spotter reports and 3) atmospheric conditions. The lack of spotter reports removes almost a third of the information available to the warning meteorologist and would be similar to a doctor trying to diagnose a patient based on tests and his or her history, but not being able to talk to them and receive real-time feedback. Recent advances in technology have certainly improved our radar information, but nothing replaces actual ground-truth reports which are critical and can help save lives.

The National Weather Service (NWS) in Des Moines currently has around 2800 spotters or nearly 55 per county. More are still needed however, especially in rural areas, as most of our spotters are clustered in cities. The need is greatest in northern and southern Iowa. Our spotters are not chasers but rather points of contact that call the NWS with severe weather reports, or are available for inquiries from NWS staff regarding conditions in their area. All participants are volunteers and never asked to alter their plans on any given day. Being a spotter is a great way to volunteer in your community. Your report may make the difference in a severe weather situation and save lives.

If you would like more information on the NWS Des Moines Spotter Program such as training dates, on-line training, field guides, course notes and registration information, please visit the link noted at the beginning of this article. Other information is available by contacting Warning Coordination Meteorologist Jeff Johnson (jeff.johnson@noaa.gov) or Spotter Program Leader Brad Small (bradley.small@noaa.gov), both at (515) 270-4501.



Severe Weather Awareness Week *continued from page 1*

Severe Weather Awareness Week information plus links to national preparedness materials are on the National Weather Service Des Moines web site at www.weather.gov/desmoines. Another excellent source of safety information is on the BeReadyIowa.org web site. (www.BeReadyIowa.org)

Media coverage is vital to the success of Severe Weather Awareness Week and it will be greatly appreciated. Please contact Jeff Johnson at the National Weather Service by telephone at 515-270-4501 or by e-mail at jeff.johnson@noaa.gov to schedule a flood safety and/or a severe weather preparedness interview, or to partner in preparedness activities or productions.



EF5 tornado approaching Parkersburg, IA on 25 May 2008. Picture courtesy of Grundy County Sheriff.

Flood Safety Awareness Week *continued from page 1*

Tuesday: Turn Around Don't Drown (TADD). Do you know that more than half of all flood-related deaths are drownings that result from vehicles caught in flood waters and then swept downstream? People often underestimate the force of water. Most vehicles lose contact with the road in six inches of water and can be swept away in 18 to 24 inches of water.

Wednesday: Floods, droughts and other related phenomena. A variety of flooding and related phenomena threaten life and property in all 50 states and territories throughout the entire year. Some of the flooding types in our area include flash flooding, river flooding and overland flooding which result from heavy rain, snow melt and ice jams.

Thursday: Flood insurance. Do you know that flood losses are typically not covered in homeowners' insurance policies? Nearly everyone is at risk of experiencing damage from flooding. According to the Federal Emergency Management Agency (FEMA), everyone lives in a flood zone. It's just a question of whether you live in a low, moderate or high risk area. Flood insurance is available, however, to help you insure your property against flood losses.

Friday: Flood safety. If you know what to do before, during and after a flood you can increase your chances of surviving a flood. We at the NWS cooperate with our partners to inform you how to become aware of the flood risks in your area and then react properly when a flood threatens you.

Fun Fact:

		Total	Tornado	Large Hail	Damaging Wind
2008 Storm	United States	31,155	2,192	13,797	15,166
Reports	Iowa	1,333	164	533	636

Spring Flood Outlook *by Jeff Zogg, Senior Service Hydrologist*

On February 27th NWS Des Moines issued its first spring flood outlook. It covers the time period from March 2nd through May 31st and addresses rivers in north central, central and south central Iowa. Here are the outlook's highlights:

The risk of flooding is near to below normal at most locations. The risk is slightly above normal at some locations along the Raccoon, Skunk and Chariton Rivers.

There is an above normal risk of ice jams where river ice still exists. Any ice jams which do occur may result in locally higher river stages.

Deep frost depth values suggest a higher than normal risk of short-term flooding and flash flooding if heavy rains occur before the ground thaws out, especially from Interstate 80 northward.

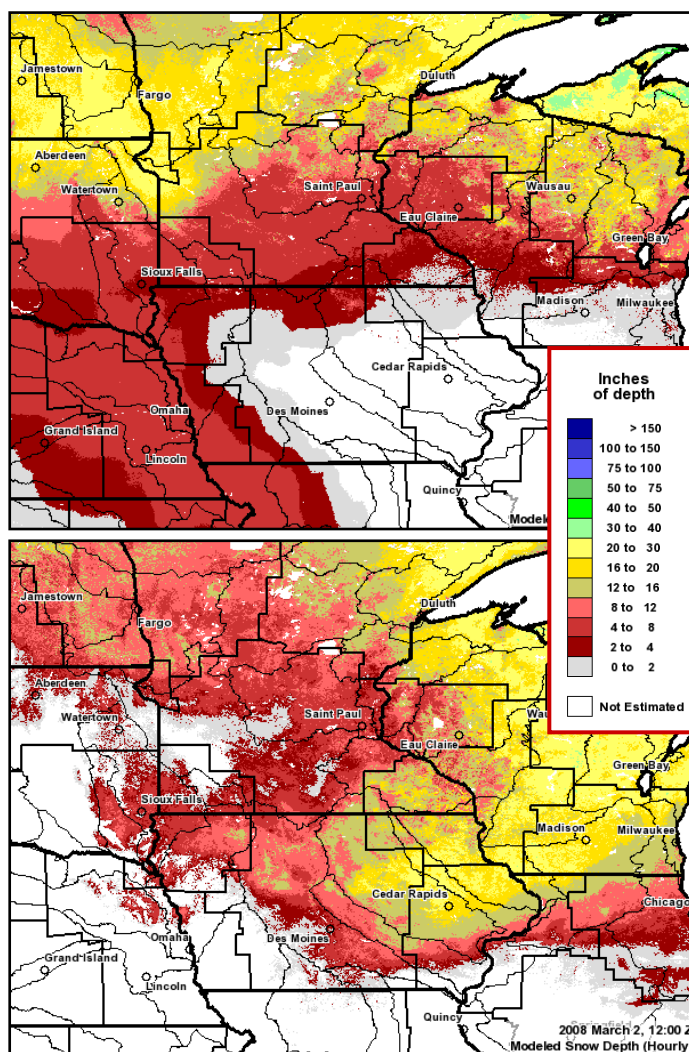
Please note—this outlook assumes that near normal precipitation and temperatures will occur during the outlook time period. If precipitation and temperatures are not near normal then the actual risk of flooding may be different than what the outlook indicates. For example, if precipitation ends up being above normal then the actual risk of flooding may be higher than the outlook indicates. Conversely, if precipitation ends up being below normal then the actual risk of flooding may be lower as well.

NWS Des Moines will issue its second spring flood outlook on March 13th. We will update our outlook based on any observed or forecast weather or river changes which occurred since our first outlook. We may also issue an optional additional outlook on March 27th depending on the flooding potential. For more information please visit our web site (<http://www.weather.gov/desmoines>).

Fun Fact: During June 2008 a total of 61.2 billion cubic feet of water passed by Saylorville Dam and its spillway on the Des Moines River. This was over 3 1/2 times the normal volume of water for June and 2/3rds of the normal volume of water for the entire year. It was enough water to cover the entire City of Des Moines to a uniform depth of 29 feet.

Spring Rainfall Statistics (March 20 - June 21)

Location	Normal	2008 Spring Season Total
Des Moines	11.28"	20.73"
Mason City	10.52"	21.26"
Waterloo	11.18"	26.85"
Ottumwa	11.44"	17.85"



Maps of snow depth across the Upper Mississippi River valley on March 2, 2009 (top) and one year earlier on March 2, 2008 (bottom). This year's snow pack is significantly different from last year's pack. Graphics courtesy of the NOAA's National Operational Remote Sensing Center (<http://www.noahrs.noaa.gov/>).

Fun Fact: During June 2008 a total of 87.3 billion cubic feet of water passed through the City of Waterloo on the Cedar River. This was 6 times the normal volume of water for June and 90% of the normal volume of water for the entire year. It was enough water to cover the entire City of Waterloo to a uniform depth of 52 feet.

Winter 2008-2009 In Review *by Miles Schumacher and Craig Cogil, Senior Meteorologists*

The past winter turned out to be quite volatile as was expected in the forecast made last fall. Record to near record warmth occurred in late December when southern Iowa saw readings in the 60s in late December, and again several times during February. However, Iowa experienced its second year in a row of winter temperatures below normal as a whole. There were some regional differences as the northeast corner of the state was much below normal. Moving to the southwest, temperatures became closer to normal and were slightly above normal in the far southwest. The past two winters have bucked the trend of much warmer than normal winters experienced from 1997-2006. Record to near record cold occurred during a few days in mid January. In fact, arctic air masses in mid January brought the coldest air in over a decade to much of Iowa. Waterloo tied their all-time record low at -34° F on the 16th, but the coldest temperature in Iowa occurred in Belle Plaine at -38° F. Overall, the winter was cooler than normal in Iowa, but fell in the near normal tercile, or central one third of all observations.

2008-2009 Seasonal Snowfall Statistics (July 1– Feb 28)

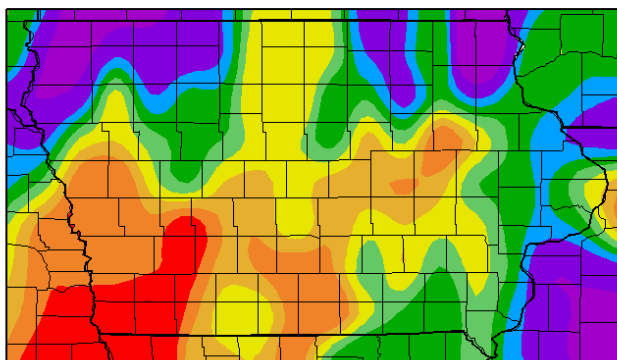
Location	Season Total	Departure	Previous Season Total
Des Moines	39.9"	+9.5"	56.6"
Mason City	40.5"	+8.8	32.0"
Waterloo	43.6"	+14.9"	50.8"

Precipitation during the period was generally below normal. The exception was during the month of December which saw several weather systems cross the state. These produced ample precipitation and snowfall for the month with both values much above normal. Otherwise, precipitation was lacking in November and for the first two months of 2009. The largest precipitation deficits were across southwest Iowa where only 50 to 70 percent of normal precipitation was recorded. Highest amounts were in the far northwest where over 150 percent of normal precipitation occurred. Snowfall was above normal in many areas, however much of the snowpack melted by March 1st as February temperatures were well above normal.

The rankings for November and December are for 136 years of records. The January and February numbers cover the past 137 years. All values are preliminary.

Month	Temperature	Departure from Normal	Rainfall	Departure from Normal	Temperature Ranking	Precipitation Ranking
November 2008	37.1°F	+1.5°F	1.75"	-0.39"	62 nd Warmest	52 nd Wettest
December 2008	17.4°F	-5.2°F	1.97"	+0.64"	17 th Coldest	18 th Wettest
January 2009	14.2°F	-3.6°F	0.70"	-0.25"	34 th Coldest	43 rd Driest
February 2009	26.3°F	+2.1°F	0.81"	-0.17"	43 rd Warmest	53 rd Driest

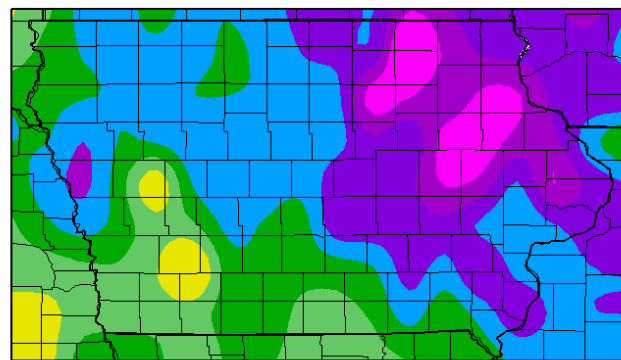
Percent of Normal Precipitation (%)
12/1/2008 – 2/28/2009



Generated 3/1/2009 at HPRCC using provisional data.

NOAA Regional Climate Centers

Departure from Normal Temperature (F)
12/1/2008 – 2/28/2009



Generated 3/1/2009 at HPRCC using provisional data.

NOAA Regional Climate Centers

Outlook for the Upcoming Spring and Summer Seasons *by Miles Schumacher, Senior Meteorologist*

Looking ahead to the upcoming spring and summer, there are some similarities in the weather pattern to what took place last year. Observing one of the dominant indicators of weather patterns for the central U.S., the tropical Pacific Ocean, we see a signal similar to what we saw last year, though it is presently a bit weaker. The tropical Pacific Ocean continues to exhibit a weak La Niña pattern with the cooler than normal water noted over the central tropical Pacific (Figure 1).

The atmosphere continues to respond to the relatively weak La Niña signal, but there are indications that the La Niña conditions in the Pacific will diminish by this summer. One change in the overall character of the Pacific Ocean needs to be taken into account. In the Pacific, there is an oscillation, similar to the El Niño-La Niña oscillation, which takes place approximately every 30 years, called the Pacific Decadal Oscillation (PDO). When in its negative phase, overall La Niña conditions are favored. Conversely, when in its positive phase, El Niño conditions are favored. Figure 2 shows the combination of La Niña and the negative PDO as it was last spring. These two features tend to work together. Therefore, it seems the odds are skewed slightly toward maintaining a weak La Niña or "cool" neutral pattern in the Pacific. The forecast for this upcoming summer is based on those assumptions. Should the pattern in the Pacific change dramatically and become more like El Niño, the outlook for the summer would turn cooler and wetter.

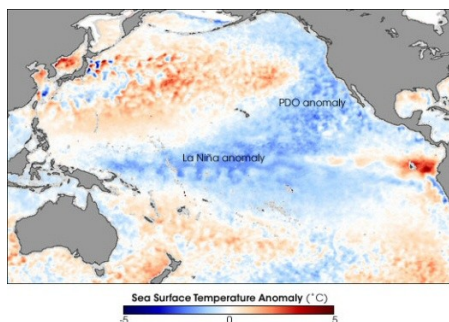


Figure 2: Sea surface temperature departures from normal showing both PDO and La Niña. Graphic courtesy of NASA.

La Niña, the remainder of the spring season is likely to be quite active again this year with more than normal rainfall. There is about a 60% chance that April will have significantly more than normal rainfall, and about 40% that May will as well. Temperatures through the spring are expected to average normal to a little below normal. The chances of May being colder than normal are higher than for April, mainly because a wet May will likely lead to fewer very warm days. See Figures 3 and 4.

The summer season forecast is tricky as mentioned above due to the weakening of the overall La Niña pattern. It appears the negative PDO will likely keep equatorial Pacific Ocean temperatures on the cool side of normal. That favors a warmer and drier pattern for the summer. The odds are highest for above normal temperatures over the central and southwest part of the state, with average temperatures closer to normal over the northeast. The entire state is likely to have less than normal rainfall for the summer, however it does not look like we are setting up for a drought at this time. Looking at the three terciles (above normal, normal, and below normal), the probability of the summer being warmer than normal is about 60%, while there is about a 20% chance of the summer ending up either normal or cooler than normal. As far as rainfall is concerned, there is about a 20% chance for a wetter than normal summer, 30% chance of normal rainfall, and a 50% chance of it being drier than normal. Figure 5 shows the most likely outcome probabilistically.

These outlooks are based more heavily on statistics than many of the methods used by the [Climate Prediction Center](http://www.cpc.ncep.noaa.gov) (www.cpc.ncep.noaa.gov). The complete set of official forecasts from the Climate Prediction Center can be found on our web-site at www.weather.gov/climate/climate_prediction.php?wfo=dmx.

BMRC/NMC Global SST Anomaly
Week Ending 22 Feb 2009

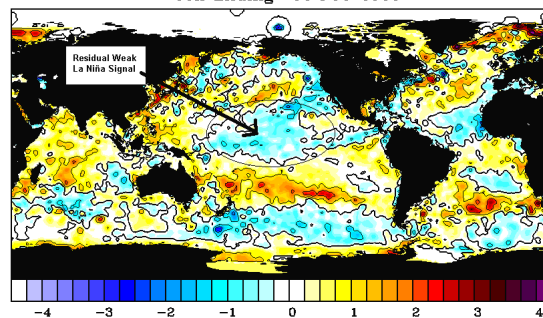


Figure 1: Sea surface temperatures departure from normal.

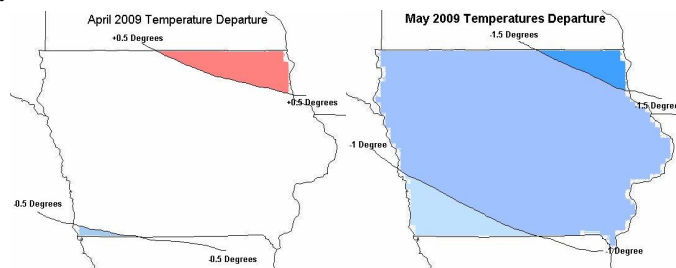


Figure 3: Mean Temperature departure forecast for April (left) and May (right).

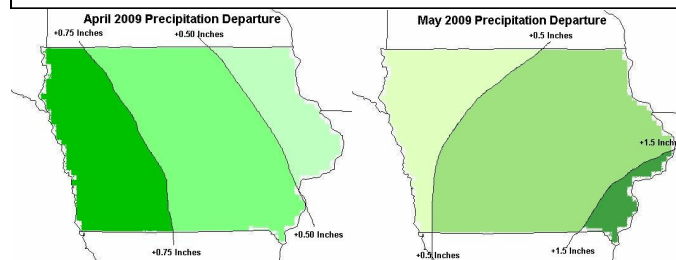


Figure 4: Precipitation departure forecast for April (left) and May (right).

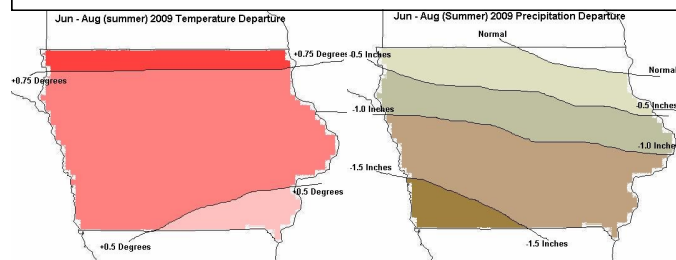


Figure 5: Summer 2009 forecast departures from normal of temperature (left) and rainfall (right).

2009 Cooperative Observer Length of Service Awards *by Brad Fillbach, Cooperative Program Leader*



Jeff Zogg (L), Senior Service Hydrologist at NWS Des Moines gives Dr. Galen Eiben (R) of Shell Rock, IA a 30-Year Service Award. Dr. Eiben is also the backup river observer for the Shell Rock River at Shell Rock.

Dr Galen Eiben of Shell Rock, Iowa, recently completed 30 years of service as a National Weather Service Cooperative Weather Observer (NWS Coop). Dr Eiben began his 30 year tenure as an official weather observer in December of 1978. Danny Starits, of Garwin, Iowa, and Lyle Sienknecht, of Clutier, Iowa, have both been part of the NWS Coop Network for 25 years and recently have accepted their Length of Service Awards from the Des Moines National Weather Service. All three observers provide pivotal precipitation and temperature data to the National Weather Service on a daily and monthly basis for their respective cities.

The weather information cooperative observers provide the National Weather Service becomes a permanent part of the climatic record for the local area and nation. This data is used extensively by many sectors including the National Weather Service, State Climatologists and numerous others in the public and private sectors. These records continue to acquire greater value with the passage of time. As concern increases about the effect of human activities on global climate, these unique and irreplaceable observations will be vital for the detection and description of any changes in climate.

There are over 300 volunteer cooperative weather observers in Iowa and nearly 12,000 nationwide. Observers are located at homes, farms, municipal facilities, utilities, dams, parks, radio and television stations, and many other locations.

Individual observers have taken daily measurements for decades with successive family generations providing records of over 100 years. The family in Iowa with the longest record was the Stern family of Logan from January 1860 to November 1960. The observer with the longest record in Iowa was Earl V. Slife of Hawarden. He began observing August 10, 1926 and retired July 3, 1993 (66 years, 10 months, 23 days). The Shell Rock weather station has reported weather information to the National Weather Service since December of 1962.



Lyle Sienknecht of Clutier, Iowa, received his 25 year Length of Service Award on November 1, 2008. Brad Fillbach, Hydro-Meteorological Technician at NWS Des Moines presented Lyle with his award.

The nation owes a sincere debt of gratitude to the cooperative weather observers who have quietly and steadily built up what amounts to a priceless national treasure in the finest tradition of volunteer service in their country. The United States Government, the National Weather Service, State Climatologist, community and others greatly appreciate this service.

Several observers across Iowa in 2008 received record rainfall. This data was extremely vital to the NWS river forecast.



Danny Starits, of Garwin, IA, accepts his 25 Year Length of Service Award. The award was presented by Steve Teachout, Hydro-Meteorological Technician at NWS Des Moines. Danny has been taking observations for the NWS since 1984 and is hoping spring will come soon so he can get into his garden. The photo was taken by Steve Teachout on February 3, 2009.

Fun Fact

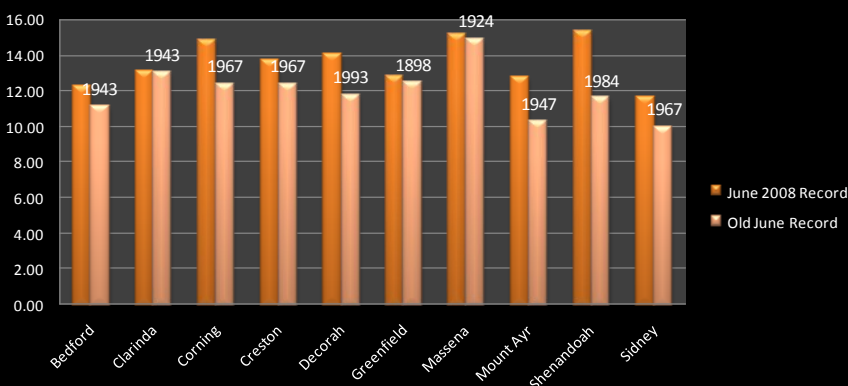
Clutier (records since 1949)

Highest Annual Rainfall = 48.21" (1982)
Highest Annual Snowfall = 45.7" (1994)
Highest Daily Rainfall = 5.74" (5/31/2008)
Highest Daily Snowfall = 9.5" (12/7/1994)

Garwin (records since 1949)

Highest Annual Rainfall = 43.91" (1990)
Highest Annual Snowfall = 48.0" (2000)
Highest Daily Rainfall = 5.40" (5/30/2008)
Highest Daily Snowfall = 12.0" (1/27/1996)

June 2008 Iowa Cooperative Observer Precipitation Records



WFO Des Moines Upcoming Product Changes *by Ben Moyer, Senior Meteorologist*



Severe thunderstorm Hail Size Criteria

In conjunction with all other offices of the National Weather Service's Central Region, the minimum hail size criteria for a severe thunderstorm will be raised to one inch in diameter, or the size of quarters beginning on **April 1, 2009**. This means that severe thunderstorm warnings will be issued when hail of 1 inch in diameter or greater, or winds of 58 mph or higher are expected.

Although damage to plant-life can occur with hail of less than one inch in diameter, joint studies by the National Weather Service and the academic community have shown that you need hail of at least one inch in diameter to pose a significant threat to life or property. Therefore, in the interest of reducing the public apathy toward severe thunderstorm warnings, we are "raising the bar" for storms that have solely a hail threat. Any storm that is expected to produce at least 58 mph winds will still receive a warning, regardless of the expected hail size. (See table below and picture above for reference on hail sizes)

Significant Weather Advisory

Beginning on April 1, 2009, WFO Des Moines will issue a Significant Weather Advisory via the Special Weather Statement (DSMSPSDMX) product for thunderstorms that are expected to produce hail of 3/4 inch, but less than one inch in diameter and/or winds of 45 to 57 mph. This product is intended to alert the public to strong thunderstorms that are just shy of becoming severe, and will be issued until the workload for higher-priority severe thunderstorms consumes our operations. *Short Term Forecasts (DSMNOWDMX) will still be issued when thunderstorms are expected in the next hour, but will provide customers with general trends and weather hazards that can be expected during the next 3 hours.*

Other Non-Routine Products Update Philosophy

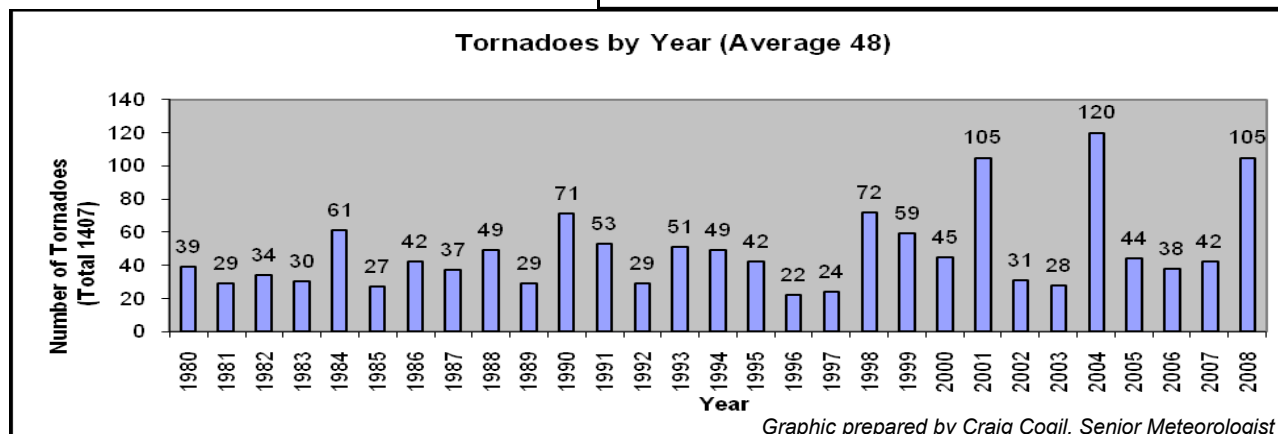
In late February 2009, WFO Des Moines instituted a new local policy that governs where and when detailed updates to winter weather and non-precipitation advisories and warnings, as well as flash flood or flood watches will occur. Previously, updates on the details of such events were provided in a Short Term Forecast (DSMNOWDMX). WFO Des Moines will now issue updates only in the appropriate hazard product.

Winter Weather Message.....DSMWSWDMX
Weather Message.....DSMNPWDMX
Flood Watch.....DSMFFADMX

These updates will occur at a frequency necessary to relay important details and changes regarding intensity, amount, and movement of hazardous weather, but no less frequently than once every 3 hours. This change was made in the spirit of reducing the number of products one has to read in order to obtain important weather information.

Object	Size
Pea	0.25 to 0.375 inch
Mothball	0.50 inch
Penny	0.75 inch
Nickel	0.88 inch
Quarter	1.00 inch
Half dollar	1.25 inches
Walnut/Ping Pong	1.50 inches
Golfball	1.75 inches
Hen Egg	2.00 inches
Tennis Ball	2.50 inches
Baseball	2.75 inches
Tea Cup	3.00 inches
Grapefruit	4.00 inches
Softball	4.50 inches

Annual Iowa Tornado Totals Since 1980



New Employee Spotlights



John standing at the shore of the Arctic Ocean in Barrow, AK in the summer of 2008.

Fun Fact: During June 2008 a total of 117 billion cubic feet of water passed through the City of Des Moines on the Des Moines and Raccoon Rivers. This was 4 times the normal volume of water for June and 3/4ths of the normal volume of water for the entire year. It was enough water to cover the entire City of Des Moines to a uniform depth of 55 feet.

John Hinsberger, *Meteorologist Intern*

I was born and raised in Indiana, then joined the Air Force after high school as a meteorologist. The military took me to New Mexico, Saudi Arabia, Alaska, Mississippi, Washington state, Italy and Spain. After spending 9 years in the Air Force, I entered the IT field as a computer/printer technician in Tucson, AZ, then spent another three years as a civilian lead meteorologist for the Department of Defense. My first National Weather Service duty station was in Barrow, AK, where I spent a little over a year. I am now a meteorologist intern here at the Johnston office. When I am not working, I enjoy reading, playing guitar and keyboard, and golfing, among other things.

Jeff Zogg, *Senior Service Hydrologist*

Hello! My name is Jeff Zogg. I have been the Senior Service Hydrologist at NWS Des Moines since September 2008. My responsibilities include collaborating with my co-workers, as well as with external partners such as emergency management and local community officials, to ensure that NWS Des Moines meets the hydrologic service needs of its partners and users. My efforts include internal and external training, as well as outreach and information technology initiatives. I am also the primary NWS liaison to the State of Iowa for NWS hydrologic services.

In addition to supporting the NWS Des Moines hydrologic services program, the Senior Hydrologist at NWS Des Moines has also traditionally supported the NWS La Crosse hydrologic services program. That will change on March 15th, however, as that office's first on-station hydrologist will begin working there. Thus, my official support for that office's hydrologic services program will end. I will still provide support to their program as needed, however, as support for their program transitions from NWS Des Moines to on-station at NWS La Crosse.

Prior to coming to Des Moines, I was the Hydrologist at NWS Davenport, Iowa since 1998. There I led the NWS's hydrologic service efforts in eastern Iowa, northwestern Illinois and northeastern Missouri during several high-end flood events, including the historic, record flooding of 2008, near-record Mississippi River spring flooding in 2001 and eastern Iowa record flooding in 1999.



Monthly Average High/Low Temperatures

Location	March (°F)	April (°F)	May (°F)	June (°F)
Des Moines	46.1 / 27.5	61.0 / 40.2	72.0 / 51.3	81.1 / 61.1
Mason City	40.6 / 22.4	57.5 / 35.3	69.9 / 46.5	79.3 / 56.5
Waterloo	43.6 / 24.4	59.7 / 36.6	71.5 / 48.2	80.7 / 58.0
Ottumwa	48.6 / 28.6	62.5 / 40.6	73.4 / 51.6	82.4 / 61.2

I was born and raised in Davenport, Iowa. I earned a B.S. in Meteorology from Iowa State University. I also did graduate work in Transportation, including Civil Engineering and Community and Regional Planning at Iowa State University. During my undergraduate work I had the wonderful opportunity of meteorologist internships at both NWS Des Moines and Davenport. My professional interests include community flood preparedness, statistical hydrology, hydrologic forecast verification and GIS.

I am thankful and excited to be working again at NWS Des Moines. Let me know if I can help you with your hydrologic service needs.

Climatological Data for December 2008 to February 2009

Location	Month	Average Temp (°F)	Departure	Highest (Day)	Lowest (Day)	Rain / Snow	Departure
Des Moines	Nov	39.0°	+1.1°	76° (3 rd)	10° (21 st)	2.37" / 4.1"	+0.27" / -0.4"
	Dec	21.4°	-3.5°	59° (27 th)	-7° (22 nd)	1.99" / 11.6"	+0.66" / +3.9"
	Jan	17.8°	-2.6°	50° (31 st)	-19° (16 th)	0.60" / 15.5"	-0.43" / +6.7"
	Feb	29.9°	+3.3°	62° (10 th)	0° (3 rd)	0.56" / 8.8"	-0.63" / +0.6"
Mason City	Nov	34.0°	+1.2°	75° (3 rd)	3° (21 st)	3.55" / 2.7"	+2.15" / M
	Dec	12.7°	-6.3°	41° (26 th)	-15° (22 nd)	0.91" / 25.4"	-0.17" / M
	Jan	9.2°	-4.7°	39° (31 st)	-31° (16 th)	0.64" / 10.2"	-0.34" / M
	Feb	21.6°	+1.0°	48° (10 th)	-9° (4 th)	0.84" / 2.2"	-0.08" / M
Waterloo	Nov	36.7°	+1.6°	75° (3 rd)	7° (21 st)	1.95" / 4.7"	-0.15" / -0.1"
	Dec	14.9°	-6.7°	49° (14 th)	-14° (22 nd)	2.01" / 20.5"	+0.90" / +13.0"
	Jan	10.9°	-5.2°	40° (31 st)	-34° (16 th)	0.62" / 11.9"	-0.22" / +3.7"
	Feb	24.9°	+2.3°	57° (15 th)	-9° (4 th)	0.56" / 3.1"	-0.49" / -4.2"
Ottumwa	Nov	38.5°	-0.9°	76° (3 rd)	8° (21 st)	1.73" / M	-0.69" / M
	Dec	20.2°	-6.4°	61° (14 th)	-7° (22 nd)	1.66" / M	+0.34" / M
	Jan	17.4°	-4.6°	56° (31 st)	-20° (16 th)	0.02" / M	-0.98" / M
	Feb	29.0°	+1.1°	63° (10 th)	-1° (4 th)	0.89" / M	-0.27" / M

Iowa Tornadoes of 2008 *by Craig Cogil, Senior Meteorologist*

Total Number of Tornadoes: 105 (2nd most since 1980)

Number of Injuries: 133

Number of Deaths: 13

Path Length of All Tornadoes: 407.2 miles

Average Path Length: 3.9 miles

Longest Path Length Individual Tornado: 41 miles

Average Width: 128 Yards

Largest Width Individual Tornado: 2100 Yards

Peak Hour of Tornado Occurrence: 7PM - 8PM CDT

Peak Month of Tornado Occurrence: June

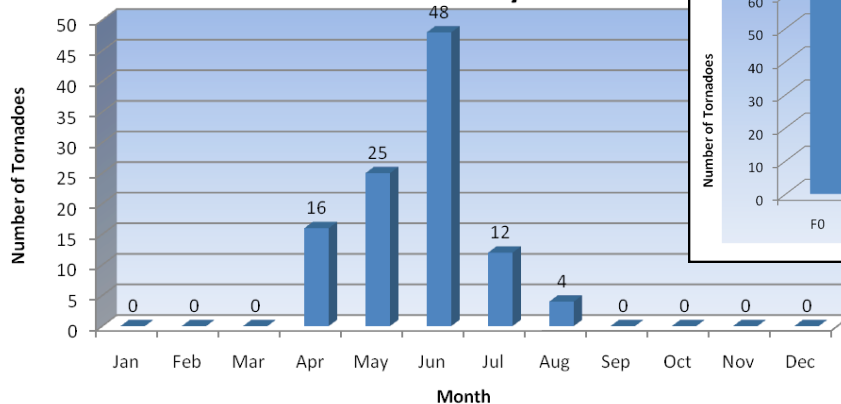
Most Tornadoes in a Day: June 11th with 16

Number of Tornado Days: 25

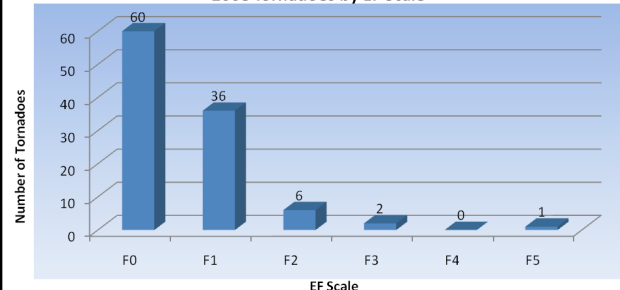


Clarke County May 25, 2008. Photo by Mike Thalman

2008 Tornadoes by Month



2008 Tornadoes by EF Scale



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Changes to Forecast and Warning Services on the Des Moines and Cedar Rivers *by Jeff Zogg, Senior Service Hydrologist*

In response to partner and user requests, NWS Des Moines has added two new locations on the Des Moines and Cedar Rivers for which we will provide river forecasts, warnings and statements. These locations are called river forecast points. The two new river forecast points are:

Des Moines River at Eddyville: this location became a river forecast point on March 2nd in lieu of discontinuing the Des Moines River at Tracy as a river forecast point. The Des Moines River at Eddyville is 18 river miles downstream from Tracy. NWS Des Moines will provide river forecasts when the river is observed or forecast to reach 60 feet. In addition, NWS Des Moines will provide river flood warnings and statements when the river is observed or forecast to reach the local flood stage of 61 feet.

Cedar River at Waverly: this location will become a river forecast point on March 16th. NWS Des Moines will provide river forecasts when the river is observed or forecast to reach 10 feet. In addition, NWS Des Moines will provide river flood warnings and statements when the river is observed or forecast to reach the local flood stage of 11.5 feet.

You can find river forecasts for both of these locations on the NWS Des Moines Advanced Hydrologic Prediction Service (AHPS) web page, just as you can for the other river forecast points. Go to <http://www.weather.gov/desmoines>, then in the left hand menu select "Rivers & Lakes AHPS."



Cedar River at Waverly, IA in June 2008.